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Chapter Author: Joosung Jun

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4 The Impact of International Tax Rules on the Cost of Capital

Joosung Jun

A sharp rise in cross-border investments in recent years has raised new questions about the competitiveness of U.S. firms in world markets and the role of tax rules in determining the cost of capital for these firms. Tax rules affect the ability of U.S. foreign subsidiaries to compete in foreign markets with local companies and with local subsidiaries of companies based in other countries. The primary channel through which taxes exert this influence is by changing the cost of capital.

The competitive ability of firms that face different costs of capital depends on how capital intensive they are and how sensitive the demand for their product is to the price. This paper does not attempt to look at specific products, but does estimate how tax rules alter the cost of capital for U.S. firms and competing firms in a variety of foreign markets.

Past comparative studies of the cost of capital have been concerned mainly with a comparison between countries of the cost of capital for domestic investment.[1] This cost differs from country to country basically for two reasons. First, the domestic cost of funds may differ across countries. Second, capital income is taxed differently, at both the personal and the corporate levels, in each country. Although previous studies did not always reach identical conclusions because of methodological differences, a typical finding of these studies is that during the past decade, the cost-of-capital gap has been largely attributable to differences in the domestic cost of funds, leaving little room for the role of tax systems.

Joosung Jun is assistant professor of economics at Ewha University.

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1. See, e.g., King and Fullerton (1984), Bernheim and Shoven (1987), McCauley and Zimmer (1989), OECD (1991), and Jorgenson (1993). For a survey of the U.S.-Japan comparison, see Poterba (1991).

In the case of multinational investment, however, an international comparison of the cost of capital is complicated by the possibility of overlapping tax jurisdictions and the possibility of raising investment funds in different countries and transferring those funds between the parent and the subsidiary. Thus, comparing the cost of capital for domestic investments between countries may lead to very misleading implications for the competitiveness of multinationals.

The objective of this paper is to estimate the degree to which international tax rules affect the cost of capital, with particular attention to U.S. firms competing with firms from other countries in major markets. The analysis involves dealing not only with multiple tax systems but also with the potential interaction of these systems. The paper first attempts to modify the conventional cost-of-capital formula in a way that incorporates the impact of international tax rules; then it estimates the cost of capital for inbound and outbound direct investment in 11 major investing countries.[2]

The evidence presented in this paper suggests that, other things being equal, corporate tax rules related to foreign investment make U.S. firms operating in major foreign markets, on average, face about a 20 percent higher cost of capital than domestic firms in the United States when U.S. source equity capital is used as the marginal source of investment funds. These U.S. firms may very likely face a higher cost of equity capital than do local firms in foreign markets. U.S. firms may also face a cost-of-capital disadvantage vis-à-vis firms from other countries in a given foreign market partly because the United States has no dividend imputation scheme and partly because the United States has relatively strict rules about the exemption or deferral of home-country tax on foreign-source income and foreign tax credit utilization.

The paper begins, in section 4.1, with a discussion of basic tax rules related to international investment. Section 4.2 presents a framework for deriving the cost of capital for foreign investment. Section 4.3 discusses the results based on the basic corporate tax systems. The implications of personal taxes and the dividend imputation scheme for the cost of equity transfers are presented in section 4.4, and the implications of international tax rules for financing foreign subsidiaries are presented in section 4.5, which is followed by a concluding section.

2. The first attempt to estimate empirically the cost of capital for international investment was made by the OECD (1991), which presented an extensive set of international comparisons of the cost of capital for both domestic and international investment in 24 member countries. Since the OECD study takes the broad perspective of evaluating the neutrality of the tax systems in the member countries and suggesting ways to coordinate national tax policies, typically the results are reported in an averaged format. This study also provides an excellent data source on tax rules related to domestic and international investment in OECD countries.

The present paper, on the other hand, focuses on several specific tax propositions that arise in a very specific setting, namely, competition among firms of different nationalities in a given location.

4.1 Tax Rules Related to International Investment

Income from international investment is subject to several layers of taxation. Host governments typically impose corporate taxes on income earned within their jurisdictions regardless of the ownership of capital. Many countries subject foreign-source income to home-country personal income taxation. In certain cases, corporate surtaxes are imposed by the home government. Countries also impose withholding taxes on income repatriated from abroad.

Such overlapping tax jurisdictions subject certain foreign-source income to both home-country and host-country taxation. Such double taxation of international income should be a deterrent to international investment because of the implied high effective tax rates. In order to avoid double taxation of international investment income and encourage free flows of capital, countries typically provide some kind of tax relief on foreign-source income. The exact nature and extent of double-taxation relief differs across countries and types of income.[3]

The most extreme, simplistic, and generous way to provide double-taxation relief is to exempt foreign-source income from home-country taxation. In this case, the only taxes charged for foreign-source income are the income and withholding taxes imposed by the host government. Only a few countries (e.g., the Netherlands) adopt this "territorial" system under which there is no residence-based taxation of foreign-source income.[4] As a result of bilateral tax treaties, however, this exemption method is, in practice, more prevalent than implied by the tax statutes of each country. A pair of countries can agree to exempt from domestic taxation their residents' income earned in the other country.

Most countries assert the right to tax the income of their residents regardless of where the income is earned. Under this more conventional "residence" system, foreign-source income is subject to home-country taxation, but a credit or deduction is allowed for taxes paid to the host government.[5]

In practice, no country allows unlimited foreign tax credits. Foreign tax credits are typically limited to home-country tax liability on foreign-source income. Investors whose potentially creditable foreign taxes exceed the actual credit limit are said to be in an "excess credit" position.[6] Thus, foreign tax credit limitations are likely to be binding when the firm invests in a high-tax

3. The approaches used to avoid double taxation of foreign-source income have been well documented in the literature (e.g., Ault and Bradford 1990; OECD 1991). This section highlights some basic aspects of double-taxation conventions that will be referred to in later sections.

4. France exempts 95 percent of foreign-source dividends from home-country taxation.

5. Countries using the territorial system tend to tax passive foreign-source income (e.g, most portfolio income) on a residence basis.

6. In some countries, these excess credits may be carried backward or forward (two or five years, respectively, in the United States).

country. If the foreign taxes paid are less than the limitation on credits, the firm is said to be in a "deficit credit" or "full credit" position.

When a multinational invests in several foreign countries, it is normally allowed to pool the income repatriated from all of these countries and credit against the domestic taxes due on this income any corporate and withholding taxes paid abroad on this income. In doing so, it can use excess credits from operations in one country to reduce any domestic taxes due on operations in another country. If, in total, its credits are sufficient to wipe out its domestic tax liabilities on its worldwide foreign operations, then no domestic corporate taxes are due. In this case, its final net income is the same as in the territorial case.

In addition to providing foreign tax credits, residence-system countries typically allow their firms to defer home-country tax on certain types of foreign-source income until the income is repatriated. In general, active business income belongs to this category. Income from passive investment (dividends and interest, e.g.) is typically taxed on an accrual basis; however. And most countries do not allow tax deferral for foreign-branch income. Tax deferral can be an important source of tax benefits since under certain circumstances it may lower the effective tax rate on foreign investment.

The asymmetric treatment of a given economic activity across different jurisdictions may significantly influence the way multinationals allocate capital between domestic and foreign operations.[7] Local investment incentives and financing sources in the host country will further complicate the investment and financing decisions of this firm.

The common notion of tax-induced location choice is based on the comparison of after-tax rates of return in different places. Thus, the argument goes, given the pretax rates of return, the statutory tax rates and investment incentives in each country will determine its attractiveness as an investment location for international investors. The main flaw with such conventional wisdom is its failure to recognize the additional layers of taxation that may be imposed on international investment, as discussed earlier. When choosing between the home country and a foreign country as a location for investment, a multinational may compare the effective tax rate on domestic investment in the home country, not with that on domestic investment in the host country, but with the total effective tax burden on international investment, which is determined by the home-country tax treatment of foreign-source income as well as host-country taxes. Even under the exemption system, in which the home country does not tax foreign-source income, the effective tax rate on international investment can differ from that for host-country competitors due to the withholding tax on repatriated income.

7. There have been a growing number of studies analyzing tax effects on multinational incentives. See Giovannini, Hubbard, and Slemrod (1993), e.g.

4.2 Cost of Capital for Foreign Investment

This section sets out a framework within which the cost of capital for foreign investment is estimated. The focus is on the way in which tax rules related to international investment influence the cost of capital.

4.2.1 Basic Model

All shareholders are assumed to live and be taxed in the home country. The foreign subsidiary is wholly owned by the domestic parent, which maximizes shareholder wealth. While the subsidiary can finance its investment through a variety of sources, the model focuses on the case where the subsidiary uses equity transfers from the parent as the basic source of funds for its investment, in order to highlight the differential tax effects on domestic and foreign investment given the same cost of funds. There are two sources of equity funds for the parent to finance its domestic investment or transfers to the subsidiary: retained earnings and new share issues. The subsidiary can also retain earnings to finance its investment.[8]

There is no uncertainty in the model, and all tax rates are perceived to be constant over time. As a notational convention, an asterisk superscript will denote host-country or subsidiary variables.

Capital-market equilibrium for the parent is attained when the shareholder earns his required rate of return ρ:

$$\rho V_t = (1 - m)D_t + (1 - z)\,(V_{t+1} - V_t - N_t), \tag{1}$$

where V_t is the market value of the firm's equity at the beginning of period t, D_t is dividend payments in period t, N_t is the value of new equity issued in period t, and m and z are the effective tax rates on dividends and capital gains, respectively.

Solving equation (1) subject to an appropriate transversality condition, we can express the value of the parent V_t as the present discounted value of after-tax dividends, net of the present value of new share issues:

$$V_t = \sum_{j=0}^{\infty}\left(1 + \frac{\rho}{1 - z}\right)^{-j}\left(\frac{1 - m}{1 - z}D_{t+j} - N_{t+j}\right). \tag{2}$$

The parent maximizes its value subject to various constraints.

The budget constraints for the parent and the subsidiary are

$$D_t + N_t^* + T_t + I_t = D_t^* + F(K_t) + N_t \tag{3}$$

and

$$D_t^* + T_t^* + I_t^* = F^*(K_t^*) + N_t^*, \tag{4}$$

8. Alternative financing sources are discussed in detail in section 4.5.

where T_t is the total tax due in the home country, including taxes on repatriated subsidiary earnings, T_t^* is the host-country tax liability, and I_t, I_t^*, $F(K_t)$, and $F^*(K_t^*)$ denote investments and profits for domestic and foreign operations.

The global budget constraint for the parent can be derived by adding equations (3) and (4):

$$T_t + T_t^* + I_t + I_t^* + D_t = F(K_t) + F^*(K_t^*) + N_t. \tag{5}$$

Other constraints include:

$$D_t \geq 0, \tag{6}$$

$$N_t \geq \bar{N}, \text{ where } \bar{N} \leq 0, \tag{7}$$

$$D_t^* \geq 0, \tag{8}$$

$$N_t^* \geq \bar{N}^*, \text{ where } \bar{N}^* \leq 0, \tag{9}$$

$$K_{t+1} = (1 - \delta)K_t + I_t, \tag{10}$$

$$K_{t+1} = (1 - \delta^*)K_t^* + I_t^*. \tag{11}$$

Equations (6) and (8) are nonnegativity conditions for dividends. Equation (7) represents restrictions on the parent's ability to repurchase shares. Similarly, equation (9) reflects restrictions on the subsidiary's ability to repatriate tax-exempt funds to the parent.[9] Equations (10) and (11) denote the evolution of the capital stock for the parent and the subsidiary, respectively, where δ and δ^* are the rates of economic depreciation.

Tax Parameters

Taxable profits of the parent and the subsidiary are

$$\pi_t^{\mathrm{T}} = F(K_t) - \delta^{\mathrm{T}} K_{t+1}^{\mathrm{T}}, \tag{12}$$

$$\pi_t^{\mathrm{T}*} = F^*(K_t^*) - \delta^{\mathrm{T}*} K_{t+1}^{\mathrm{T}*}, \tag{13}$$

where K_{t+1}^{T} is net value of the parent firm's capital stock for tax purposes at the start of period $t+1$. Note that K_{t+1}^{T} will evolve along different paths depending on the depreciation method (e.g., straight line or declining balance) used and, in any case, will evolve differently than the actual capital stock, K_{t+1}. The quantity δ^{T} is the rate of tax depreciation allowed in the home country. For foreign investment, the same variables are used with the asterisk superscript.

The tax liability of the parent company in the home country is the sum of the taxes due on its own operations and the taxes due upon repatriation of subsidiary profits:

9. The subsidiary can repatriate its equity capital ($N^* < 0$) as well as its earnings. In principle, the redemption of equity capital is tax exempt, while the repatriated earnings are taxable in the home country. In order to prevent a firm from treating all repatriated funds as equity capital, as a general rule all remissions are treated as taxable earnings as long as accumulated repayments are less than accumulated earnings.

$$T_t = T_t^P + T_t^S. \tag{14}$$

Taxes due by the parent on domestic operations are

$$T_t^P = \tau\pi_t^T + (w - c)D_t^C, \tag{15}$$

where τ is the home-country statutory corporate tax rate, w is the home-country withholding rate on dividends, and c is the rate of dividend imputation credit available in the home country. The variable D_t^C is parent dividend payments gross of any imputation credits:

$$D_t^C = \frac{D_t}{1 - c}. \tag{16}$$

It is also convenient to define the dividends, grossed up at the corporate tax rate:

$$D_t^G = \frac{D_t}{1 - \tau}. \tag{17}$$

If the home government provides the full dividend credit ($c = \tau$), D_t^C equals D_t^G. If the country adopts a classical system ($c = 0$), D_t^C equals D_t, the net dividend.

The tax liability of the subsidiary in the host country is

$$T_t^* = \tau^*\pi_t^{T*} + (w^* - c^*)D_t^{C*}, \tag{18}$$

where grossed-up subsidiary dividends are defined as

$$D_t^{C*} = \frac{D_t^*}{1 - c^*}, \tag{19}$$

$$D_t^{G*} = \frac{D_t^*}{1 - \tau^*}. \tag{20}$$

The parent firm may also owe taxes on repatriated subsidiary profits (T_t^S).[10] Depending on the treatment of foreign-source income in the home country, T_t^S will take on different values:

1. Under a territorial system or a treaty that exempts foreign-source income from home-country taxation, there is no home-country tax on foreign-source dividends:

$$T_t^S = 0. \tag{21}$$

2. Under a tax credit system, foreign-source dividends may face home-country corporate surtaxes (deficit credit position). Assuming that the home country uses the same tax base as the host country, which is D_t^{G*},

10. Deferral of home-country taxes on unrepatriated foreign-source dividends is implicitly assumed in the model.

$$T_t^S = \max\left\{\left[\frac{(\tau - \tau^*)(1 - c^*)}{1 - \tau^*} - (w^* - c^*)\right]D_t^{C^*}, 0\right\}. \tag{22}$$

3. Under a deduction system,

$$T_t^S = \tau\,[1 - (w^* - c^*)]D_t^{C^*}. \tag{23}$$

Before proceeding to the expression for the cost of capital, it will prove convenient to define two further parameters. First, let u be the total tax rate on repatriated foreign-source dividends. Depending on which of the three regimes for the treatment of foreign-source income is in force in the home country, u will take on different values, as shown in table 4.1.

Column (1) denotes the second term of equation (18), which reflects host-country taxes on repatriated dividends. Column (2) reproduces equations (21)–(23). The total tax burdens on foreign-source dividends are summarized in column (3). Notice that the value of u essentially determines the degree to which international tax rules affect the cost of capital in the model.

The other parameter, γ, is the tax discrimination variable. It indicates discrimination between retained earnings and new equity finance in the parent company and is given by

$$\gamma = \frac{1 - m}{(1 - z)(1 + w - c)}. \tag{24}$$

The Cost of Capital

The cost of capital is the pretax rate of return that a corporation must earn in order to pay the rate of return required by the providers of capital. The cost of capital, p and p^*, depends on the discount rate as well as several other considerations such as the tax treatment of capital income and the depreciation of the investment asset:

$$p = \frac{(\rho' + \delta)(1 - z)}{1 - \tau}, \tag{25}$$

$$p^* = \frac{(\rho' + \delta^*)(1 - z^*)}{1 - \tau^*}, \tag{26}$$

where ρ' is the appropriate discount rate and z and z^* are tax savings from depreciation allowances in the home and host countries, respectively.

The cost of capital critically depends on the discount rate, which is in turn determined by the source of finance and relevant tax parameters. Table 4.2 presents discount rates under alternative regimes of financing domestic and foreign investment.

If the parent uses retained earnings as the source of financing domestic investment, shareholders can accumulate wealth at a rate of return that is taxed by a capital gains tax rather than a dividend tax. If the after-corporate-tax, before-personal-tax yield of a project is ρ', then the shareholder would require

Table 4.1 **Effective Tax Rate on Foreign-Source Dividends $D^{c*}(u)$**

Home-Country Tax System	Host-Country Taxes (1)	Home-Country Taxes (2)	Total Tax on Foreign-Source Dividends (3)=(1)+(2)
Exemption system	$w^* - c^*$	0	$w^* - c^*$
Credit system	$w^* - c^*$	$\max\left\{\frac{(\tau - \tau^*)(1 - c^*)}{1 - \tau^*} - (w^* - c^*), 0\right\}$	$\max\left\{\frac{(\tau - \tau^*)(1 - c^*)}{1 - \tau^*}, w^* - c^*\right\}$
Deduction system	$w^* - c^*$	$\tau[1 - (w^* - c^*)]$	$(w^* - c^*) + \tau[1 - (w^* - c^*)]$

Table 4.2 **Discount Rate under Alternative Financing Regimes**

Regime	Discount Rate
Domestic investment	
1. Financed by parent retained earnings	$\rho/(1 - z)$
2. Financed by parent new equity	$\frac{\rho/(1 - z)}{\gamma}$
Foreign investment	
3. Financed by subsidiary retained earnings	$\rho^*/(1 - z^*)$
4. Financed by transfer of parent retained earnings	$\frac{\rho/(1 - z)}{1 - u}$
5. Financed by transfer of parent new equity	$\frac{\rho/(1 - z)}{\gamma(1 - u)}$

Note: See table 4.1 for the values of u. See eq. (24) for value of γ.

that $\rho'(1 - z) = \rho$. The discount rate for the retained earnings is given by $\rho' = \rho/(1 - z)$, as shown on line 1 of table 4.2.[11]

When the parent finances investment by new share issues, the shareholder receives $(1 - m)\rho'/(1 + w - c)$ as the after-tax dividend yield.[12] In equilibrium, this yield must be equated with ρ, the required rate of return. The parent's discount rate for new equity is, therefore, given by $\rho' = (1 + w - c)\rho/(1 - m)$, which is the same expression as the one shown on line 2.[13]

Consider now the appropriate discount rates for the finance of foreign investment. When the subsidiary uses its retained earnings to finance the investment, the cost of capital is defined to be the same as that for domestic investment financed through retained earnings in the host country.[14]

If the subsidiary draws funds from the parent, the discount rate should reflect the additional taxes associated with repatriated dividends. As indicated on lines 4 and 5 of table 4.2, this international tax effect can be summarized by the term $1/(1 - u)$, where u is the effective tax rate on foreign-source dividends as described in table 4.1. From the perspective of the parent, whose objective is to maximize the wealth of its domestic shareholders, the net receipts from a dollar of repatriation equal $1 - u$ dollars. Since the opportunity cost of transfering a dollar to the subsidiary is the dollar equivalent of forgone domestic

11. If the required rate of return ρ is set to be $(1 - m)i$, the opportunity cost of investing in the firm, where i is the interest rate, then ρ' equals $i/[(1 - m)/(1 - z)]$ as in King and Fullerton (1984, 23).

12. Note that net dividend payments are grossed up at the net imputation $(c - w)$ rate.

13. Again, if ρ is set to be $(1 - m)i$, $\rho' = (1 + w - c)i$.

14. This assumption will make the empirical results of this study comparable to those in OECD (1991). Jun (1989) defines the discount rate for subsidiary earnings in an alternative way that links the yield on foreign investment and the opportunity cost of domestic investment.

Table 4.3 **Impact of International Tax Rules on Discount Rate: An Example**

	Host-Country System					
	Classical, or No Dividend Credit to Foreign Firms ($c^* = 0$) (1)		Full Dividend Credit to Foreign Firms ($c^* = \tau^*$) (2)		Limited Dividend Credit to Foreign Firms ($c^* = w^*$) (3)	
Home-Country System	u	$1/(1-u)$	u	$1/(1-u)$	u	$1/(1-u)$
Exemption	0.05	1.05	−0.35	0.74	0	1.00
Credit	0.17	1.20	0.10	1.11	0.16	1.19
Deduction	0.53	2.13	0.33	1.49	0.50	2.00

Note: $\tau = 0.5$, $\tau^* = 0.4$, $w^* = 0.05$.

investment, the parent should require that foreign investment earn a yield at the rate of $1/(1-u)$ times the rate of return required on domestic investment.

The magnitude of u depends on the tax treatment of foreign-source dividends both in the home and host countries as shown in table 4.1. Table 4.3 shows an example in which the impact of international tax rules on the discount rate ($1/(1-u)$) is calculated using realistic parameter values under different tax systems in both the home and the host countries. Each column reflects a different extent to which a multinational receives dividend imputation credits for corporate taxes paid to the host government.

In order to focus on the impact of the home-country tax system on the discount rate, consider first the most common case, where there are no dividend imputation credits available for foreign firms (col. [1]).[15] Under the exemption system in the home country, $u = w^*$ and the discount rate for foreign investment will be 5 percent larger than that for domestic investment using the same source of funds. Under the credit system, however, there arises a home-country surtax at the rate of 17 cents per dollar of dividends paid by the subsidiary. This surtax translates into a 20 percent higher discount rate. The impact of the deduction method on the discount rate is more than twice that of the exemption method.

The tax treatment of repatriated dividends in the host country may also significantly influence the discount rate. Withholding taxes on dividend payments to foreign parent companies are typically reduced by a tax treaty (typically by 5–15 percent) and do not show much variation among countries. A potentially more important and more uncertain aspect of host-country taxation of subsidiary dividends is the extent to which a country extends dividend imputation credits to foreign shareholders. Few countries provide unlimited dividend

15. This is either because the host country does not have any imputation scheme (the classical system) or because the host country denies foreign shareholders such credits.

credits to foreign shareholders. Among the major imputation countries, the United Kingdom has the statutory rules that are the most generous toward foreign parents receiving dividends from their subsidiaries but still only a half-credit is allowed for the residents of a limited number of countries.

Multinationals may, however, have substantial flexibility in avoiding such statutory restrictions. A subsidiary may pay dividends to another subsidiary located either in a country that receives more favorable treatment or even in the same host country. If a multinational succeeds in receiving the full imputation credits available, this firm can substantially lower the discount rate for foreign investment as shown in column (2).

Column (3) depicts an example of partial credits. In any case, the impact of dividend imputation credits available in the host country on the cost of capital for foreign investment is likely to be unpredictable and variable across countries.[16]

4.2.2 Measuring the Cost of Capital

In the remainder of the paper, various cost-of-capital measures for U.S. firms and their major competitors in foreign markets are presented. The methodology used to calculate the cost of capital in this paper closely follows the approach developed by King and Fullerton (1984) and OECD (1991).

There are three rates of return on an investment, p, r, and s: the pretax rate of return, the after-corporate-tax rate of return, and the after-corporate-and-personal-tax rate of return, respectively. This study adopts the "fixed-r" approach in which for a given real interest rate (r), the pretax rate of return (p) is calculated using the tax code. A common real interest rate of 5 percent is assumed for the purpose of focusing on the tax effects on the cost of capital and maintaining comparability between countries. Thus, the cost-of-capital measures reported in the following sections are the pretax rates of return necessary to earn a given after-corporate-tax rate of return (real interest rate) of 5 percent.

In the base case estimation, personal taxes are ignored. In practice, the role of personal taxes in determining the cost of capital may be less clear in the case of the parent-subsidiary relationship than the shareholder-parent relationship. The parent, as a single shareholder, may be subject to different rules and incentives than individual shareholders. The most important aspect of the parent's being a shareholder of the foreign subsidiary is the role of the dividend imputation scheme in the home and host countries in determining the cost of capital for foreign investment, which is fully discussed in section 4.4.

While the base case focuses on all-equity financing regimes, debt financing, often ignored in the literature, has been an important source of foreign investment. Especially significant is the presence of local borrowing by foreign sub-

16. See section 4.4 for more discussion of this issue.

Table 4.4 **Cost of Capital for U.S. and Competing Firms in Foreign Markets**

Host Country	Local Firms (1)	U.S. Firms (2)	Japanese Firms (3)	U.K. Firms (4)	German Firms (5)
United States	7.6	7.6	10.7	8.5	10.9
Japan	9.0	10.6	9.0	11.3	12.8
Canada	8.1	9.5	11.8	10.1	13.7
France	7.3	9.7	11.2	10.8	11.2
Germany	9.5	8.3	11.7	7.8	9.5
Netherlands	7.1	7.8	10.9	8.0	10.3
United Kingdom	7.7	8.6	11.8	7.7	7.7
Italy	9.1	9.9	10.8	6.8	13.0
Sweden	7.2	8.8	12.0	8.2	8.5
Switzerland	6.6	8.2	11.4	7.6	9.6
Australia	9.0	11.5	12.1	12.5	15.1
Average (foreign investment)	8.0	9.3	11.5	9.2	11.3

sidiaries. Section 4.5 discusses the implications of international taxation for the financing policy of subsidiaries.

A common inflation rate of 4.5 percent is used everywhere. Thus, all the variations in the cost of capital for foreign investment across countries are due purely to differences in their corporate tax systems. For comparability, the values for tax parameters are drawn from the OECD and relate to the systems in force as of January 1, 1991.[17] A 11 × 11 matrix of the cost of capital for 11 countries investing in each other is calculated under each financing regime. These 11 countries are Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States. While the OECD reports various average measures across its member countries, the main focus of this study is on U.S. firms competing with firms from other countries in foreign markets. The major findings are described in the following sections. The appendix reports the full cost-of-capital matrices for the base case.

4.3 Effects of the Basic Corporate Tax Systems

This section focuses on the effects on the cost of capital of the basic corporate statutes in the sample countries. Results based on possible behavioral responses by multinationals are reported in the following sections.

4.3.1 Domestic Investment versus Foreign Investment

Compare first the costs of capital for domestic investment and foreign investment. Table 4.4 presents the cost of capital for U.S., Japanese, U.K., and Ger-

17. For a complete list of data parameters, see OECD (1991, 220–33).

man firms as well as local firms operating in the 11 sample countries. In this base case, parent retained earnings are assumed to be the marginal source of funds for both domestic and foreign investment.

Column (1) reports the cost of capital for domestic investment. This result can be comparable to traditional international comparisons of the cost of capital except that this study isolates the impact of corporate taxes from other influences. The effects of corporate tax rules on the cost of capital differentials for domestic investment between countries do not appear to be large, which is in line with the findings of most previous studies. Across countries, the required pretax rates of return on domestic investment are higher in Japan, Germany, Italy, and Australia than in other countries, reflecting their relatively high corporate tax rates. U.S. domestic firms face a lower cost of capital (7.6 percent) than Japanese domestic firms (9.0 percent) because of relatively high corporate tax rates in Japan. Note that several studies have found that U.S. firms are at a competitive disadvantage relative to firms in Japan. In McCauley and Zimmer (1989) and Bernheim and Shoven (1987), for example, the cost-of-capital gap in 1988 was 4.0 and 7.0 percent, respectively. The cost-of-capital advantage of U.S. firms in this study (1.4 percent), therefore, reiterates the significance of the difference in the cost of funds between the two countries in the 1980s.

Now consider the cost of capital for firms from major investing countries. As shown in column (2), U.S. firms face a significantly higher cost of equity capital for foreign investment than for domestic investment. In the sample host countries, U.S. firms face about a 20 percent higher cost of capital on average than in the case of U.S. domestic investment (9.3 vs. 7.6 percent). In Japan, the cost of capital for foreign investment is about 40 percent higher than that for domestic investment in the U.S. (10.6 vs. 7.6 percent).

Firms from other countries also face similar tax costs when they invest abroad. Columns (3)–(5) indicate that the average costs of capital for Japanese, U.K., and German firms investing in the sample countries are about 20–30 percent higher than for domestic investment in their home countries. Corporate taxes seem to play an important role in affecting the competitiveness of firms in foreign markets, contrary to the case when the costs of capital for domestic investment are compared.

4.3.2 Competition with Local Firms

The results in table 4.4 also indicate that because of the tax costs associated with foreign investment, firms investing abroad may very likely face a higher cost of capital than local competitors. For example, a 20 percent higher cost of capital for foreign investment would put U.S. multinationals in a disadvantageous position in most foreign markets. Comparing columns (1) and (2) indicates, in fact, that U.S. firms face a higher cost of capital than their local counterparts in every sample country. Similar results are obtained for firms from other countries.

Table 4.5 **Cost of Capital for Foreign Firms Operating in Japan, the United Kingdom, and Germany**

Home Country	In Japan (1)	In the United Kingdom (2)	In Germany (3)
United States	10.6	8.6	7.4
Japan	9.0	11.8	8.2
Canada	11.1	6.0	7.9
France	11.7	8.0	5.4
Germany	12.8	7.7	9.5
Netherlands	10.6	6.3	8.2
United Kingdom	11.3	7.7	7.8
Italy	11.8	14.0	6.4
Sweden	10.6	6.3	8.2
Switzerland	10.6	6.3	8.2
Australia	13.9	7.7	7.4
Average (foreign investment)	11.5	8.3	7.5

Because of the tax costs associated with international investment, U.S. firms face a higher cost of equity capital than do local firms in Japan (10.6 vs. 9.0 percent), according to the calculations that underlie the figures reported in table 4.4. As noted above, Japanese firms have enjoyed a cost-of-capital advantage over U.S. firms due mainly to the difference in the cost of funds between the two countries. Since the results reported here are based on the assumption that there are no cost-of-funds differentials between countries, the negative impact of international tax rules on the cost of capital can be interpreted as an additional source of disadvantage for U.S. firms operating in Japan when these firms draw transfers from their domestic parents.

4.3.3 Competition among Foreign Firms

In a foreign market, U.S. firms compete not only with local firms but also with firms from other investing countries. Table 4.5 shows the cost-of-capital measures for firms from different countries operating in Japan, the United Kingdom, and Germany.

In Japan, the variation of the cost of capital across investing countries is not large. This is mainly because the high Japanese corporate tax rate dominates the tax rates in investor countries in determining the overall effective tax rate on foreign investment in Japan. The cost of capital for U.S. firms (10.6 percent) is not greater than for firms from other countries, though the difference is not large. One interesting observation is that those firms whose cost of capital is higher than that for U.S. firms are from countries with a dividend credit scheme (Canada, France, Germany, the Netherlands, the United Kingdom, Italy, and Australia).[18]

18. A related discussion is presented in the next section.

In other countries, the cost of capital for U.S. firms is close to the sample average. Note that the cost of capital for foreign firms in the United Kingdom shows relatively greater variation across investor countries. This is because low U.K. corporate taxes are often dominated by home-country taxation of U.K.-source income in determining the cost of capital.

4.4 Personal Taxes and the Dividend Imputation Scheme

The costs of two sources of parent equity funds—new equity and retained earnings—are different mainly for two tax reasons, as discussed in section 4.2. First, a personal tax advantage for capital gains relative to dividends will lower the cost of retained earnings for the parent. On the other hand, a dividend imputation scheme will make the cost of parent new equity lower than that for parent retained earnings for financing domestic investment.

4.4.1 Effects of the Dividend Imputation Scheme in the Home Country

Some countries try to restrict investors' ability to use the dividend imputation scheme on dividends from domestic corporations financed by earnings from abroad. Typically, countries require that dividends eligible for the dividend imputation scheme be less than the firm's after-tax profits from domestic operations. Unless a firm desires an abnormally high dividend payout rate, however, this restriction is unlikely to be binding.

If shareholders in the countries with the dividend imputation scheme are allowed to take such dividend imputation credits for foreign-source dividends, firms from some of these countries can possibly lower the cost of capital for foreign investment by using parent new equity instead of parent retained earnings as the source of transfers. Table 4.6 presents the cost-of-capital measures that reflect personal taxes and dividend credits for firms investing in Japan.

Columns (1) and (2) show the impact of the home-country imputation scheme on the relative costs of capital for the two sources of equity transfers. Personal taxes are ignored to highlight the influence of the dividend imputation scheme. For firms from countries with the classical system, therefore, the cost of capital is the same for the two cases. Firms from countries with a dividend imputation scheme have a clear advantage over U.S. firms. Without dividend credit benefits, the cost of capital for U.S. firms is at the low end of the spectrum (col. [1]). With credits available, however, the average cost of capital over firms from imputation countries is 5.4 percent, about half of the cost of capital for U.S. firms (col. [2]). This result suggests the potential importance of integrating personal and corporate taxation in enhancing U.S. competitiveness.

Columns (3) and (4) report the results that combine the effects of personal taxes and dividend credits. Overall, the cost of capital is lower here than in the base case since the nominal required rate of return is defined to be $(1 - m)i$ in the calculations. The effects of relatively lower effective tax rates on capital gains are dominant in most of the sample countries, though the impact of the

Table 4.6 **Personal Taxes and Dividend Imputation Credits in the Home Country: Firms Operating in Japan**

	No Personal Taxes		Personal Taxes	
Home Country	Parent Retained Earnings[a] (1)	Parent New Equity[b] (2)	Parent Retained Earnings[a] (3)	Parent New Equity[b] (4)
Japanese domestic	9.0	9.0	6.6	11.2
United States	10.6	10.6	5.3	7.8
Canada	11.1	7.3	2.6	4.2
France	11.7	6.8	7.9	17.7
Germany	12.8	2.4	1.8	2.4
Netherlands	10.6	10.6	0.4	10.6
United Kingdom	11.3	6.4	4.9	3.9
Italy	11.8	4.6	6.3	7.3
Sweden	10.6	10.6	6.4	8.5
Switzerland	10.6	10.6	3.0	10.6
Australia	13.9	4.7	4.1	1.6
Average (foreign investment)	11.5	7.5	4.3	7.5

[a]Transfer of parent retained earnings.

[b]Transfer of parent new equity with dividend credits for foreign-source dividends.

imputation scheme has a significantly offsetting impact in those countries with such a scheme. In Australia and the United Kingdom, parent new equity is still the cheaper of the two sources.

In the presence of widespread foreign financing sources (see the next section) and international portfolio investment with the possibility of tax evasion,[19] the role of personal taxes in determining the required rate of return on foreign investment in not as clear as in the model presented earlier. In principle, there must be no dividend credits when there is no dividend taxation. However, the corporate veil between domestic shareholders and foreign investment may be thick and complex enough for multinationals to somehow manage to get some dividend credits even when personal taxation on the level of domestic shareholders does not affect their cost of capital. If this is the case, the first two columns of table 4.6 will represent a more realistic picture of the cost-of-capital gap across financing sources and investor countries.

4.4.2 Effects of the Dividend Imputation Scheme in the Host Country

The presence of the dividend imputation scheme provides incentives to reduce the cost of capital, not only for the subsidiaries of the domestic parent,

19. For a discussion of tax effects on international portfolio investment, see Gordon and Jun (1993).

Table 4.7 **Dividend Imputation Credits to U.S. Firms in the Host Country**

Host Country	Limited Credits (1)	Full Credits (2)
United States	7.6	7.6
Japan	10.6	10.6
Canada	9.5	8.6
France	9.7	7.6
Germany	8.3	6.3
Netherlands	7.8	7.8
United Kingdom	8.6	8.6
Italy	9.9	6.7
Sweden	8.8	8.8
Switzerland	8.2	8.2
Australia	11.5	8.9
Average (foreign investment)	9.3	8.2

but also for the local subsidiaries of firms in other countries. As discussed in section 4.2, most countries deny dividend credits to foreign shareholders. However, some firms may have enough flexibility to avoid such statutory restrictions. Table 4.7 presents results based on the assumption that U.S. firms can get the full credits available in foreign countries. Column (1) produces column (2) of table 4.4, the base case result based on the notion that restrictions in the tax statutes are strictly binding.[20]

In most sample countries with the imputation scheme, U.S. firms can lower the cost of capital.[21] In the United Kingdom, there is no change in the cost of capital, which is not surprising. The United Kingdom taxes corporate income rather lightly, and benefits from the full credit ($c = 0.250$) are not a large addition because U.S. firms are already allowed to take a half-credit (0.125). U.S. firms, therefore, must still face a U.S. surtax, and the total effective tax rate is determined mostly by the U.S. taxes. On average, U.S. firms can lower their cost of capital about 12 percent (from 9.3 to 8.2 percent) in the sample countries.

4.5 Implications for Local Financing Sources

In the face of a high cost of capital for foreign investment financed through equity transfers by the parent, the subsidiary may seek alternative sources of funds. First, parent transfers can be made in debt instead of equity. These two types of transfer differ in terms of the rate of withholding tax in the host country and the tax treatment of repatriated income in the home country. While

20. Note that personal taxes in the home country are ignored for the results in this table.
21. These countries are Canada, France, Germany, Italy, and Australia.

many countries in the sample adopt the exemption method for foreign-source dividends,[22] all sample countries adopt the credit method for foreign-source interest. In the host countries, on the other hand, interest payments face lower withholding taxes than dividend payments in many cases. The cost-of-capital difference between these two types of transfers in the actual calculation is small and not separately reported.[23]

4.5.1 Local Debt Financing

It is likely that more important alternative sources of funds lie in the host country. Local borrowing, which is ignored by most previous studies of foreign investment, has been an important source of funds for foreign investment. At the end of 1989, the share of local and other foreign borrowing in total external finance for U.S. firms operating abroad was 60.3 percent. The corresponding figure for foreign firms operating in the United States was 71.2 percent.

In general, because interest payments are tax deductible, debt financing should be preferred to equity financing as far as taxes are concerned. Column (3) of table 4.8 shows that the cost of capital for foreign investment financed by local borrowing is much lower than that for equity financing regimes. The deduction benefits are proportional to the marginal corporate tax rate in a country, and debt financing is particularly attractive in Japan and Germany because of their relatively high corporate tax rates.

Local debt may be an especially attractive way of financing foreign investment for the following reasons. First, the tax cost of not using debt is much higher for foreign investment than for domestic investment, as shown in column (5) of table 4.8. For domestic investment in the United States, the tax cost of using equity financing is 5.0 percent. For U.S. firms operating in Japan, for example, the cost can be as large as 9.0 percent. This result reflects the tax costs associated with international investment.

Firms usually do not raise the leverage ratio as much as tax benefits would suggest because of various nontax costs associated with leverage, such as perceived bankruptcy or agency costs. In the case of multinational investment, however, the nontax cost of using debt may not be as significant as for domestic investment. A multinational may face less risk of default, since it can pool relatively independent risks from its operations in several different countries and so be able to borrow more. In addition, if it can use its combined assets as collateral for loans, regardless of which affiliate does the borrowing, then it can concentrate its borrowing in the country where the deductions are most valuable.

Thus, the tax benefits of an interest deduction may be a much more important determinant of corporate leverage for a foreign subsidiary than for a

22. These countries are Canada, France, Germany, the Netherlands, Sweden, Switzerland, and Australia, assuming a tax treaty for residence-system countries.

23. In most sample countries, debt transfer has a slight edge over equity transfer.

Table 4.8 **Advantage of Local Financing for U.S. Multinationals**

Host Country	Transfer of Parent Equity (1)	SRE[a] with Tax Deferral (2)	Local Debt Financing (3)	Tax Cost of Not Using SRE[a] ((1)–(2)) (4)	Tax Cost of Not Using Local Debt ((1)–(3)) (5)
U.S. domestic	7.6	7.6	2.6	0.0	5.0
Japan	10.6	9.0	1.6	1.6	9.0
Canada	9.5	8.1	3.5	1.4	6.0
France	9.7	7.3	3.2	2.4	6.5
Germany	8.3	9.5	0.6	−1.2	7.7
Netherlands	7.8	7.1	2.8	0.7	5.0
United Kingdom	8.6	7.7	3.5	0.9	5.1
Italy	9.9	9.1	1.9	0.8	8.0
Sweden	8.8	7.2	3.6	1.6	5.2
Switzerland	8.2	6.6	3.1	1.6	5.1
Australia	11.5	9.0	3.6	2.5	7.9
Average (foreign investment)	9.3	8.1	2.7	1.2	6.6

[a]SRE = subsidiary retained earnings.

purely domestic firm. In addition, foreign borrowing is an important way to hedge against exchange risks associated with foreign-source income.

When borrowing abroad, a U.S. multinational may have an incentive to concentrate its borrowing where tax benefits are large. Japan, Germany, Italy, and Australia are more attractive places for foreign borrowing than Canada, France, the Netherlands, the United Kingdom, Sweden, and Switzerland as far as taxes are concerned. This observation might become more relevant as integrated world capital markets narrow differences in interest rates between countries.

4.5.2 Tax Deferral and Subsidiary Retained Earnings

If, for some nontax reasons, a U.S. firm has to finance foreign investment using an equity source, subsidiary retained earnings are typically cheaper than parent equity transfers, except in Germany where split corporate tax rates discriminate against retained earnings (table 4.8, col. [4]). Note, however, that the cost of capital for subsidiary retained earnings as reported in this study implicitly assumes that home-country taxes on unrepatriated earnings can be deferred. If such deferrals are not allowed in the United States, then the cost of capital for foreign investment financed through subsidiary retained earnings will be higher for firms that are in a deficit credit position than those reported in column (2).[24]

Unlike the foreign tax credit, the main objective of which is to avoid double taxation of foreign-source income, tax deferrals have been a source of controversy in the United States because this provision gives home-based multinationals a tax incentive to keep placing their earnings in foreign countries. Further, the deferral of the home tax on foreign-source income is often regarded as a violation of the principle of tax neutrality between domestic and outward foreign investment (capital export neutrality) since taxation of domestic-source income generally cannot be deferred.

4.6 Conclusions

Tax rules related to international investment significantly raise the cost of capital for foreign investment. The tax costs associated with foreign investment will easily put foreign subsidiaries in a disadvantageous position relative to local companies. The extent to which tax rules raise the cost of capital for foreign investment varies across investor countries. Firms from countries with a dividend imputation scheme may face a lower cost of equity transfers than those from countries with no such benefits, such as the United States.

The evidence presented in this paper suggests that, as an effect of tax rules, U.S. foreign subsidiaries that draw equity transfers from their parent firms

24. Technically, in such a case, the cost of capital for subsidiary retained earnings becomes equivalent to that for transfer of parent equity (col. [1]), in the setting of this paper.

likely face a higher cost of capital than local firms in major foreign markets. This is an addition to the much heralded cost-of-funds disadvantage in the United States. U.S. firms may also face a cost-of-capital disadvantage in foreign markets vis-à-vis competing firms that face low-cost equity transfers due to dividend imputation schemes in their home countries.

There are several additional factors that may add to the competitive burden of U.S. firms operating abroad. Among major investor countries, the United States has the tightest rules regarding the exemption or deferral of home-country tax on foreign-source income and regarding the limitation of foreign tax credits. For example, the Tax Reform Act of 1986 has made pooling of worldwide income more difficult for U.S. firms by confining the eligibility to earnings from majority-owned subsidiaries, while many other countries tried to adopt the exemption method by statutes or by treaties; unlike its major competitors, the United States considers a loan that a subsidiary makes to its parent to be the equivalent of a dividend, to which a U.S. surtax may be applied; a recent U.S. tax bill (H.R. 5270: *Foreign Income Tax Rationalization and Simplification Act of 1992*) includes a provision that repeals tax deferral; the United States is the only major developed country that does not grant tax-sparing credits to developing countries, possibly making U.S. multinationals face a much higher effective tax rate in developing countries than firms from other countries with a treaty including tax-sparing credits.

As the increasing international integration of financial markets narrows the cost-of-funds differentials between countries, tax rules will play a more important role in determining the cost of capital for firms investing in foreign markets.

Appendix

Table 4A.1 **Cost of Capital Financed through Equity Transfer of Parent Retained Earnings**

	Home												
Host	Japan	Canada	France	Germany	Netherlands	United Kingdom	Italy	Sweden	Switzerland	Australia	United States	Average	Standard Deviation
Japan	9.0	11.1	11.7	12.8	10.6	11.3	11.8	10.6	10.6	13.9	10.6	11.3	1.2
Canada	11.8	8.1	10.4	13.7	9.5	10.1	13.5	10.4	10.4	12.3	9.5	10.9	1.7
France	11.2	11.6	7.3	11.2	9.7	10.8	15.4	9.0	9.7	16.1	9.7	11.1	2.5
Germany	11.7	7.9	5.4	9.5	8.2	7.8	6.4	8.2	8.2	7.4	8.3	8.1	1.5
Netherlands	10.9	8.9	8.3	10.3	7.1	8.0	12.8	7.1	7.1	11.3	7.8	9.1	1.9
United Kingdom	11.8	4.7	8.0	7.7	6.3	7.7	14.0	6.3	6.3	7.7	8.6	8.1	2.5
Italy	10.8	8.3	13.4	13.0	9.1	6.8	9.1	10.8	11.8	14.2	9.9	10.7	2.2
Sweden	12.0	10.0	7.2	8.5	7.2	8.2	15.2	7.2	7.8	11.1	8.8	9.4	2.4
Switzerland	11.4	9.4	7.8	9.6	6.6	7.6	14.4	7.3	6.6	10.5	8.2	9.0	2.3
Australia	12.1	5.8	12.9	15.1	11.5	12.5	13.3	11.5	11.5	9.0	11.5	11.5	2.3
United States	10.7	9.5	8.8	10.9	8.3	8.5	11.8	8.3	8.3	11.9	7.6	9.5	1.5
Average	11.2	8.7	9.2	11.1	8.6	9.0	12.5	8.8	8.9	11.4	9.1	9.9	2.0
Standard deviation	0.8	2.0	2.4	2.2	1.6	1.8	2.6	1.7	1.9	2.6	1.2	1.9	

Table 4A.2 **Cost of Capital Financed through Equity Transfer of Parent New Equity**

	Home												
Host	Japan	Canada	France	Germany	Netherlands	United Kingdom	Italy	Sweden	Switzerland	Australia	United States	Average	Standard Deviation
Japan	9.0	7.3	6.8	2.4	10.6	6.4	4.6	10.6	10.6	4.7	10.6	7.6	2.8
Canada	11.8	5.5	6.2	2.8	9.5	5.9	5.3	10.4	10.4	4.4	9.5	7.4	2.8
France	11.2	7.4	4.4	2.1	9.7	6.1	5.5	9.0	9.7	5.1	9.7	7.3	2.7
Germany	11.7	5.2	3.1	1.6	8.2	4.5	2.4	8.2	8.2	2.5	8.3	5.8	3.1
Netherlands	10.9	5.7	4.8	1.6	7.1	4.5	4.6	7.1	7.1	3.6	7.8	5.9	2.4
United Kingdom	11.8	4.1	4.9	1.5	6.3	4.6	5.3	6.3	6.3	2.8	8.6	5.7	2.7
Italy	10.8	8.2	7.7	8.4	9.1	4.0	3.7	10.8	11.8	4.8	9.9	8.1	2.7
Sweden	12.0	6.5	4.3	1.6	7.2	4.7	5.5	7.2	7.8	3.8	8.8	6.3	2.7
Switzerland	11.4	6.0	4.4	1.5	6.6	4.2	4.9	7.3	6.6	3.3	8.2	5.9	2.5
Australia	12.1	8.2	7.7	3.3	11.5	7.4	5.6	11.5	11.5	3.6	11.5	8.5	3.2
United States	10.7	6.1	5.1	1.8	8.3	4.8	4.4	8.3	8.3	3.9	7.6	6.3	2.5
Average	11.2	6.4	5.4	2.6	8.6	5.2	4.7	8.8	8.9	3.9	9.1	6.8	2.7
Standard deviation	0.8	1.2	1.4	1.9	1.6	1.0	0.9	1.7	1.9	0.8	1.2	1.3	

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Comment Joel Slemrod

In 1991 the Organisation for Economic Co-operation and Development (OECD) published a massive 469-page volume entitled *Taxing Profits in a Global Economy;* its goal was to examine how the OECD member countries taxed corporate profits and the potential implication of these apparent differ-

Joel Slemrod is professor of business economics and of economics at the University of Michigan and a research associate of the National Bureau of Economic Research.

ences in taxation for domestic and international investment flows. Included in the study was the most careful calculation up to that time, of the cost of capital for domestic, and more specifically, cross-border direct investments. This volume contains scores of charts and thousands of numbers about the cost of capital for a company resident in country X investing in country Y, so many that the report itself despairs that "it is difficult to draw any general conclusions from such a large quantity of data." It then proceeds to venture some conclusions, including that "all countries appear to discourage outward investment compared to domestic investment by their resident companies. They also place a high effective tax rate on inward investment by foreign companies compared to domestic companies and compared to domestic investment by resident companies. Further, this result holds irrespective of the means of financing the subsidiary chosen by the parent, unless the subsidiary merely retains its earnings" (OECD 1991, 158). The OECD report also concludes that, on average, the required return of Japanese multinationals is significantly higher than that of U.S. multinationals, except for investments located in Japan itself.

In this paper Joosung Jun uses the OECD data and apparently uses something very similar to the OECD methodology to arrive at more or less these same conclusions as in the OECD report. In spite of the apparent similarity in methodology and conclusions, this paper contains several noteworthy incremental contributions. Let me try to summarize them.

1. The cost-of-capital measures are derived in a more straightforward way, and the results are presented in a tighter, and to my mind, clearer way than in the OECD report.

2. The cost-of-capital calculations highlight the role of the assumptions made about the parent company's source of financing. Although column (1) of Jun's table 4.6 is, except for one entry, exactly the same as the information in the OECD report's table 5.1, the others are new, but very similar to the OECD calculations, particularly in the ordering. The differences arise because the OECD report presents cost-of-capital calculations only under the assumption that the parent companies finance their subsidiaries using a weighted average of retentions, new equity, and debt, the same weighted average for all countries. Jun presents the cost of calculation separately for each kind of financing.

3. It highlights the role in the cost of capital of corporate and personal tax integration, and particularly how foreign owners are treated under these regimes (see also Devereux and Freeman 1994). In most cases integration benefits are not passed on to foreign owners, and the benefits of integration to domestic shareholders are not available on foreign direct investment. With regard to the former restriction, Jun devotes his table 4.7 to cost-of-capital calculations assuming that foreign firms "have enough flexibility" to avoid such statutory restrictions, suggesting that this may be closer to the truth than assuming the restrictions are binding. This is an important assertion that cries out for some supporting evidence. Can it really be as easy as setting up two tiers of

affiliate corporations so that the dividends paid from the first to the second-tier affiliate receive the imputation credit?

4. It highlights the empirical and conceptual importance of local debt financing and makes the interesting point that, considering tax advantages, local debt financing looks even more attractive than in a domestic context, because it can potentially avoid three, rather than two, layers of tax on equity-financed capital.

Although this paper raises insightful new issues within the now-standard framework introduced by King-Fullerton and used by the OECD, it does not extend this framework in some directions that I believe are critical to understanding the impact of taxation on foreign direct investment.

For example, the standard model ignores differences in how domestic-source and foreign-source income are calculated by a given country. For example, the United States uses an earnings and profits concept to measure the foreign-source income for the purpose of calculating the limitation on the foreign tax credit: this is different from both the U.S. concept of taxable income and any host country's definition of income; accelerated depreciation does not apply, nor are there research and development or investment tax credits.

The definition of what is domestic-source and what is foreign-source income also differs across countries. This raises the possibility of double or zero taxation, even when tax rates are the same across countries. Thus, it is crucial to examine the effect on the cost of capital of such provisions as interest allocation rules, R&D allocation rules, and the U.S. export-source rule, under which half of the income earned on U.S.-produced exports is denoted foreign source. This is of no importance to a purely domestic company, but to a multinational in an excess credit position, it expands the foreign tax credit limit and can thereby increase the amount of foreign income taxes that can be credited against U.S. tax liability.

The most glaring omission in the standard model is income shifting. Implicitly, it assumes that income is costlessly observable by the tax enforcement agency. That is an untenable assumption in a closed domestic economy. It is completely unrealistic in an open economy, where the very concept of where income is earned is slippery, and there is substantial empirical evidence of nontrivial income shifting done by multinational enterprises. An important question is to what extent the ability to shift taxable income from high-tax to low-tax countries offsets the tax disadvantage to multinationals due to overlapping jurisdictions that is documented in Jun's paper and others. The potential for income shifting also affects the allocation of real investment. Ireland is more attractive than otherwise as a site for multinational investment because it has a low statutory corporation income tax that makes it a magnet for income shifting. The same marginal effective tax rate on investment could be achieved with a higher statutory tax rate and more nonrate incentives such as accelerated depreciation, but this would not be as attractive for real investment, as multina-

tionals look ahead to the possibility that once real operations are located in Ireland, income shifting can occur. What is required is an "income shifting adjusted" cost of capital, as calculated in Hines and Rice (1994) and Grubert and Slemrod (1993).

Finally, I suggest that there is a large payoff for more disaggregated studies of the taxation of cross-border investment. For example, the residual tax imposed upon repatriation is likely to place a large penalty on a U.S. company which operates predominantly in low-tax countries, but not on companies which operate largely in high-tax countries. In this sense, the issue is not country specific as much as it is sector specific or firm specific. A firm-specific approach would allow one to take advantage of information concerning whether a firm is in an excess or deficit foreign tax credit position.

I would like to close my remarks with a few random thoughts about the thriving cost-of-capital "industry," of which this paper is a part. First, an easy point. It is well documented that cost-of-capital calculations such as those in this paper are very sensitive to essentially arbitrary assumptions about such things as rate of inflation, real rate of return, and the sources of marginal financing. On a more constructive note, I encourage the participants in this industry to do more to justify its existence. In particular, it remains to be seen whether the marginal effective tax rates that are generated by these procedures are more successful in explaining phenomena such as the pattern of foreign direct investment than less conceptually appealing, but also less arbitrary, alternatives based on average tax rates.

To sum up, this paper by Joosung Jun is a careful and thoughtful addition to the literature that uses the King-Fullerton framework to address the tax disincentives to foreign direct investment. This framework needs to be extended to properly address some of the critical issues in the taxation of multinational corporations.

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